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Renewable Energy Certificates and Air Emissions Benefits

Developing an Appropriate Definition for a REC

Patrick Leahy and Alden Hathaway
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The Renewable Energy Certificate Market

The past few years have witnessed the emergence of the Renewable Energy Certificate (REC) market as a viable model for the U.S. renewable energy industry. Once considered an esoteric topic for even the most ardent renewable energy expert, RECs have grown in popularity and exposure thanks to efforts of the renewable energy industry as well as several large purchases by high profile corporations and governmental organizations. Although still in its infancy, the Renewable Energy Certificates (RECs) market holds the potential to bring renewable technologies into the mainstream.

As a result of such dramatic growth, a broad spectrum of market participants are revisiting some basic questions surrounding the definition of a REC, i.e. "What exactly is a REC? And what is its impact on air emissions?" As the market continues to mature, it will become increasingly important to answer these types of questions in a manner that reflects the broadest set of stakeholders and can lead to integration with capped emissions markets.

Renewable energy (RE) generation results in several valuable benefits. Among these are:

- Increased energy diversity and security;
- Reduced price volatility in the energy markets;
- Improved energy reliability from distributed generation;
- U.S. economic development and job creation;
- Environmental benefits from reduced land and water impacts; and
- Improved air quality.

Because the deployment of renewable energy often displaces fossil-fired generation, it has long been suggested that ownership of the resulting emission reduction benefits should be assigned to the renewable energy certificate. While this approach may seem reasonable, unilateral ownership claims on avoided emissions benefits present significant legal obstacles and ultimately inhibit the development of an actively traded REC market.

Environmental Resources Trust, Inc. (ERT)
1612 K Street, NW • Suite 1400 • Washington, DC 20006 • Tel 202.785.8577 • Fax 202.785.2739 •
www.ert.net

This paper will seek to demonstrate that a preferable definition for a Renewable Energy Certificate is "unique and exclusive proof that one MWh of electricity has been generated from a renewable resource."[1] Based on this foundation, the paper will then explore a powerful set of market-based tools designed to spur increased demand for renewable energy and encourage innovative sources of financing for the renewable energy industry.

What is a Renewable Energy Certificate?

A REC is a market-based commodity designed to facilitate transactions between buyers and sellers of renewable energy, free from the constraints of the electricity grid. It allows renewable energy generators to deliver the benefits of green power (detailed above) to customers without engaging in the cumbersome exercise of scheduling physical delivery of the electrons. This has significantly benefited the renewable energy industry by broadening the market beyond the scope of local utilities with green power programs to include corporate and residential end-users.

Physically, it is impossible for the "purchaser" of green power from the grid to consume only the electricity produced by the renewable generator. Once electrons are placed on the grid, they are irreversibly mixed with electrons from other generators as they flow along the continuously changing path of least resistance. The green power purchaser consumes a composite mix of electrons generated from all of the plants interconnected to the grid. Any premium paid for the green power is effectively financial support for the inclusion of a renewable resource in the overall generation portfolio.

RECs were developed to broaden the potential customer base by overcoming the geographic and transactional barriers confronting green power procurement. Often the best sites for green power generation, such as wind farms, are not located in the territory of a utility serving a densely populated urban area. By de-linking financial support for renewable energy from the physical delivery of the electricity, RECs not only reflect the realities of the transmission grid, but also serve as a vehicle for electricity purchasers to provide clear, direct financial signals in support of renewable electricity.

There are currently two distinct REC markets in the US: a voluntary market driven by consumers interested in supporting renewable energy or reducing their environmental footprint; and a compliance market driven by government regulation. The voluntary market is segmented by technology. Pricing generally reflects the excess cost of generation above conventional resources on a technology specific basis.

The compliance market is driven by state legislation and is significantly larger than the voluntary market. To date, thirteen states have implemented Renewable Portfolio Standards (RPS), requiring all utilities to purchase a minimum percentage of their power from renewable resources. Four of these programs, Texas, Massachusetts, Connecticut and New Jersey, have actively traded REC markets. Within each market, prices reflect the supply / demand balance for the commodity value of one MWh of renewable energy. Prices vary across markets due to individual market design characteristics.

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[1] Jansen Jaap, "A Green Jewel Box?", Environmental Finance, March 2003 pp 27. and Natsource. Williamson, Matthew, "Estimating Benefits from Renewable Energy", CEC Technical Meeting, July 17, 2003

As with any evolving market, several fundamental issues have yet to be resolved. Most notably, there are at least two competing definitions for RECs in the U.S. market:

- ERT and several other market-oriented organizations define a REC as "unique and exclusive proof that one MWh has been generated by a renewable resource." In other words, a REC guarantees that one MWh of renewable electricity has been generated in place of conventional electricity.

- The Center for Resource Solutions, which is the largest REC certifier in the US, defines a REC as "A generic term for a bundle of attributes except the actual electrical energy associated with the generation of electricity at a renewable energy facility."[2] The "bundle of attributes" includes environmental attributes such as emissions offsets or avoidances.[3] These differing definitions present a conflicting view on whether or not ownership of emission offsets is conveyed in a REC.

This conflict, although subtle, has significant implications for the future of renewable energy and its ability to maximize financial value while maintaining critical standards of environmental credibility. Currently, several states are contemplating renewable energy legislation and efforts are underway to develop carbon trading programs in the U.S., most notably, the Northeast Regional Greenhouse Gas Initiative. It is imperative that the renewable industry reach a consensus on this issue as quickly as possible in order to provide clear and decisive direction to policy makers and market designers.

The principal difference between the two positions concerns the ownership of emission reductions created when renewable generation displaces electricity from conventional resources. ERT firmly believes that a definition of renewable energy certificates that implies ownership of these emissions reductions is ultimately untenable and counterproductive. The following sections will highlight some of the shortcomings of this approach, by focusing on legal, environmental and market efficiency implications.

Legal

In the United States, law is the foundation of property rights. Ownership rights exist if and only to the extent that they are recognized by law.[4] In the absence of a legal framework to assign property rights, ownership claims are subject to legal challenge. This point is particularly significant when considering the impact of renewable generation on unregulated greenhouse gas emissions. Property rights concerning air emissions are just emerging and default ownership rights have not yet been defined. At best, ownership claims on emission reductions generated by renewable energy are uncertain.[5]

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[2] www.green-e.org/what_is/dictionary/dictionary.html.

[3] CRS defines environmental attributes in the following way: "Environmental attributes include the environmental benefits and costs associated with the construction and operation of specific types of power generation facilities. For renewable facilities, their environmental attributes might include the benefits of such things as emissions offsets or avoidance, as say from wind-generated electricity." Reference: www.green-e.org/what_is/dictionary/dictionary.html.

[4] Sprankling, John G. Understanding Property Law, Lexis Publishing, New York, NY 2000 pp 2

[5] Barnes, Peter. Who Owns the Sky? Our Common Assets and the Future of Capitalism, Island Press, Washington DC 2001, pp

The only instance in the U.S. in which ownership rights for air emissions have been established involves regulated "cap and trade" programs established under the Clean Air Act of 1990 for sulfur dioxide (SO_2) and nitrogen oxides (NO_x). Emission allowances represent the legal right to emit a specific amount (usually 1 ton) of a particular pollutant. Prior to any compliance period, a regulatory body allocates and/or auctions a fixed quantity of allowances to eligible program participants. Emitters must comply by making emissions reductions and/or buying allowances in the emissions market. At the end of the compliance period, all emitters must hold one allowance for every ton of the regulated pollutant released during the compliance period.

Only to the extent that renewable generators are awarded title to emission allowances through an allocation program will they be able to monetize the value of their reduced air emissions.[6]

Environmental Integrity and Double Counting

In anticipation of an eventual mandatory greenhouse gas trading program, a voluntary market for CO_2 reductions is beginning to emerge among public and private entities intent on controlling their emissions. Because generation from a renewable resource often displaces fossil fired generation, RECs are viewed as one option for meeting CO_2 targets. Although convenient, this practice overlooks several inconsistencies that would become apparent in a formalized trading environment.

By nature, RECs create an indirect emissions offset. The World Resources Institute's GHG Protocol defines indirect emissions as "emissions that are a consequence of the activities of the company but occur as sources owned or controlled by another company."[7] In addition to the uncertainty of ownership addressed in the previous section, trading in indirect emissions offsets is likely to compromise the environmental integrity of the market.

To illustrate the concept, consider a hypothetical grid consisting of one brand new wind plant and one coal generator meeting a fixed demand. In this scenario, each MWh of wind power displaces one MWh of coal generation and avoids the associated CO_2 emissions (approximately one ton). When calculating emissions, the coal plant would compare year-on-year measurements taken at the smoke stack, conclude that it has reduced emissions by one ton and sell the reduction into the market. Similarly, the wind generator would estimate that it backed down one MWh of coal-fired generation, conclude that it has reduced emissions by one ton and sell the reduction into the market. When multiple entities claim ownership of the same reduction, it is known as double counting.[8] In reality, the risks of double counting are even greater because one MWh from a wind plant could impact multiple generators to varying and unknown degrees, increasing the odds that the reductions will be counted twice.

As policy direction in this area becomes clearer and trading increases, the issue of indirect reductions may resolve itself. In the event that the current voluntary

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[6] The most common approaches are the renewable energy allowance set-aside program for NOx established by six states under the NOx Budget Trading Program and SO_2 established by federal legislation.

[7] World Resources Institute, The Greenhouse Gas Protocol: A Corporate Accounting and Reporting Standard, Revised Edition. pp 25

[8] Hammerschlag, Roel and Wiley Barbour, Life Cycle Assessment & Indirect Emission Reductions: Issues Associated with Ownership and Trading, May 2003. pp. 8

environment persists, the market should naturally demand a more stringent framework within which to operate. As purchasers recognize the tenuous claims of indirect reductions they will discount them appropriately. Likewise, if a mandatory CO_2 cap and trade program is established, the issue of indirect reductions would be eliminated. In a cap and trade system the only way to reduce emissions is to take ownership of and retire the emission allowances.

The point of this section is not to imply that the indirect environmental impact does not exist in an un-capped system. Rather, the intent is to emphasize that the ambiguity of *ownership* claims on these indirect benefits may lead to issues of double counting.[9]

Market Efficiency

The definition of a REC has significant implications for market efficiency. Consider the example of two identical wind farms located in the same power pool (PJM), but on either side of the Maryland-Pennsylvania state line. The State of Maryland has a NOx set aside program that allocates a percentage of emission allowances to renewable energy generators, whereas Pennsylvania does not. As a result, the Maryland wind generator receives tradable NOx allowances for each MWh generated.

If a REC is defined to include <u>all</u> associated emissions reductions, the Maryland wind generator would be forced to incorporate the allowances obtained from the set-aside pool in any REC sale. This poses a dilemma when comparing RECs from the Maryland and Pennsylvania wind farms. Under the above definition they would have to be considered identical and, presumably, be able to make identical environmental claims. Logically, however, the market would treat the two RECs as distinct products since they contain unique value propositions.

Furthermore, given that NOx allowances can be worth several thousand dollars per ton, the market would clearly value the two products differently. Consumers familiar with the NO_x allowance value would place a premium on the RECs with attached emission allowances. Assuming markets are allowed to function properly, that premium would equal the value for NO_x allowances established by the emissions market.

Re-defining Renewable Energy Certificates

Markets work most efficiently when commodities are valued according to the relative supply and demand for each specific product. By allowing buyers and sellers to value individual elements properly, markets are able to provide clear pricing signals for the underlying commodity.

This principle holds true in the REC market as well. Although there is a relationship between the green power and emissions markets, the drivers for buying and selling emission allowances are distinct from those for renewable energy. Attempting to artificially link the REC and emissions markets hampers the ability for buyers and sellers to price each commodity appropriately, which results in distortions, as demonstrated above.

[9] Under a legislated emissions cap and trade program, there are several mechanisms through which regulating bodies can convert indirect emissions offsets into tradable allowances. These are discussed in the following section.

Efficient outcomes can only be achieved when the value of a ton of emissions is determined by the emissions market and the value of a MWh of renewable energy is determined by the REC market. Increased market definition and clarity leads to more accurate pricing signals on the true value of renewable power and enables improved investment decision-making.

Building upon these fundamental principles, Environmental Resources Trust submits that the most appropriate and constructive definition for a renewable energy certificate is *"unique and exclusive proof that one MWh of energy was generated from a renewable resource."*[10]

WHY IS THIS ISSUE IMPORTANT?

There are three reasons why the renewable energy industry should concern itself with this issue:

- Accuracy in environmental disclosure
- Product innovation and increased demand
- Enhanced revenue potential through formalized participation in emissions markets

Environmental Disclosure

The National Association of Attorneys General (NAAG) made the following assertions in its 1999 ruling on Renewable Energy Credits:

> "It is deceptive to misrepresent, directly or by implication, that a product or company offers a general environmental benefit. Unqualified claims of general benefit are difficult to interpret, and, depending on their context, may convey a wide range of meanings to consumers. […] Every implied representation that the general assertion conveys to consumers must be substantiated. Unless this substantiation duty can be met, broad environmental claims should either be avoided or properly qualified, as necessary, to prevent deception about the specific nature of the environmental benefit being asserted." [11]

Marketers who define a REC to include ownership of all emissions reductions benefits are making claims that cannot be substantiated from a legal perspective. Attempts have been made to exclude claims regarding cap and trade pollutants, but the message that filters through to the REC purchaser is often vague at best, and misleading at worst.

To comply with the NAAG guidelines, REC marketers must also refrain from ownership claims regarding non-regulated pollutants. Without a legal framework to assign property rights, any claims on the emissions benefits associated with renewable energy are ambiguous. In fact, precedents established for other pollutants suggest that the emitter has a stronger claim to ownership of emissions reductions.

It is important to emphasize that a measurable environmental benefit generally does result from the generation of renewable electricity. However, *ownership* of these

[10] Op. cit Jansen and Williamson

[11] National Association of Attorneys General, Environmental Marketing Guidelines for Electricity, Environmental Marketing Subcommittee of the Energy Deregulation Working group, December 1999. pp.12

benefits is unclear and REC marketers must be careful not to make un-substantiated claims in this regard.

Increased Demand through Product Innovation
The renewable energy industry stands to benefit from increased demand spurred by improved market clarity and definition. Increased market definition leads to more innovation as marketers are able to tailor products specifically to the needs of their customers.

The number of products available is likely to rise as marketers combine the underlying commodity REC with emissions allowances and derivatives to structure innovative new products that satisfy customer demand at a competitive price. As has been the case with other commodities, allowing customers the flexibility to purchase a differentiated product inevitably leads to increased demand and drives future revenue potential.[12]

Enhanced Revenue Potential
De-linking the definition of a REC from its impact on emission reductions allows the renewable energy industry to tap into a potentially significant source of revenue from emissions markets.

In a cap and trade system, the regulatory cap dictates total emissions of a particular pollutant from a specific set of facilities. Under current law and regulations, allowances are primarily allocated on an historic, fuel-input basis, irrespective of the kilowatt-hours generated. In the previous example (with a single coal plant and single wind plant meeting a fixed electric demand) the coal plant will generate one less MWh for every MWh produced by the wind farm. The coal generator will emit less NOx, require fewer NOx allowances and as a result, will either have excess allowances to sell into the market or will need to purchase less NOx allowances to meet its target. In either case, the wind farm effectively creates "breathing room" under the cap for the coal generator and lowers their control costs.

In an emissions market, this "breathing room" is valuable. NOx allowances for 2004 are currently trading in the $2,300 per ton range.[13] Therefore, each ton of NOx that the wind farm displaces creates $2,300 of value for the coal generator in the emissions market.[14] The conclusion that renewable electricity reduces the control costs for polluters in emissions markets is powerful for the renewable energy industry.

The United States is trending toward increased emissions regulation through cap and trade programs. In addition to the existing EPA-administered SO_2 and NO_x trading programs, EPA's recently proposed Interstate Air Quality (addressing transport impacts on ozone and fine particles) and Utility Mercury Reduction (creating a first-ever market for a toxin) Rules encourage states to employ new cap and trade programs for SO_2

[12] Contrary to past consideration of this issue, the ability to add emissions allowances to a commodity REC is likely to increase (not decrease) the accuracy and credibility of environmental claims in the market.
[13] EvoMarkets, Monthly Market Update Feb 2004
[14] It is important to point out that renewable energy has no impact on aggregate NOx emissions in a cap and trade system. The only way to reduce emissions is to acquire a NOx emissions allowance and retire it without producing a ton of NOx.

(tighter), NO_x (broader), and hg (for the first time). Lastly, almost a dozen northeast states are currently working towards the implementation of a mandatory cap on CO_2 emissions from the electric power sector in their region (known as the Regional Greenhouse Gas Initiative) despite the current lack of support for a mandatory cap on CO_2 at the national level.

Under a multi-pollutant trading scenario, one MWh of wind power can create value for the coal plant in each of the emissions markets**. This fact provides justification for restructuring emissions markets to enable renewable generators to capture the value they create through set-aside programs or direct output-based allocations**.

It is incumbent upon the renewable energy industry to mount an organized campaign promoting mechanisms that will equitably allocate emission allowances under new cap and trade programs to renewable generators. A paper prepared by David Wooley for the Renewable Energy Policy Project in 2002 estimates the revenues generated from a properly designed multi-pollutant cap-and-trade program could net the renewable energy industry $1.3 billion per year by 2010.[15]

Conclusion

The renewable energy industry faces a unique window of opportunity to establish the foundations upon which future markets will be built. Federal and state governments are currently considering regulations and legislation that will likely establish precedents affecting the renewable energy industry for decades to come. By shaping the understanding upon which these policies are based, the renewable energy industry can encourage a policy framework that promotes a strong, vibrant and credible renewable energy market.

We face an opportune moment to reconsider the definition of the basic REC commodity with the goal of furthering the long-term interests of the renewable industry and the environment. ERT asserts that the most practical and productive definition of a REC is "unique and exclusive proof that one MWh has been generated by a renewable resource." This definition promotes market efficiency, transparency, and environmental integrity while facilitating the integration of the REC and emissions markets and maximizing revenue streams for the renewable energy industry.

[15] David Wooley, "A Guide to the Clean Air Act for the Renewable Energy Community" Renewable Energy Policy Project (REPP) February 2000, pp. 21

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